

REMARKS/ARGUMENTS

Status of Claims and Rejections

Applicants appreciate the examination of all claims 1-70. Claims 1-39, 49, 51, 54-56, 58-68 and 70 are pending.

Claims 1-11, 13-18, 21, 25-31, 34-44, 46, 49-55, and 57-70 were rejected as anticipated under 35 USC § 102(b) by Chiles et al. (U.S. Pat. No. 4,574,723).

Claims 12, 24 and 45 were rejected under 35 USC § 103(a) as being unpatentable over Chiles et al. in view of Lasky et al. (U.S. Pat. No. 6,598,554).

Claims 19 and 20 were rejected under 35 USC § 103(a) as being unpatentable over Chiles et al. in view of Ambs (U.S. Pat. No. 6,028,817).

Claims 22, 23, 32, 33, 47, 48 and 56 were rejected under 35 USC § 103(a) as being unpatentable over Chiles et al. in view of Vatne et al. (U.S. Pat. No. 5,357,892).

The Present Application

The present application describes and claims deflectors, systems for adjusting deflectors in a seismic survey, and methods of use. Systems comprise a generally upright deflector body and at least one bridle connected to a seismic cable. The bridle includes an upper segment secured to an upper connection point on the deflector body, and a lower segment coupled to a lower connection point on the deflector body. The upper bridle segment, lower bridle segment and deflector body define a geometry between themselves. This geometry is adjustable by at least one actuator so as to control the tilt angle of the deflector body, and thus control depth of the deflector.

The Cited Art

Chiles et al. disclose (Abstract) a paravane handling system which includes a wing-shaped paravane connected by four lines to a hitching device which in turn is connected by a main line to a winch onboard a vessel. The four lines and hitching device may be used to control the angle of attack or incidence of the paravane, as well as tilt angle. One disclosed paravane construction includes remotely controllable rudder devices which may control both the angle of attack and tilt angle. The stated purpose of the rudders is for varying the angle of

incidence and therefore the (lateral, crossline) direction of travel of the paravane. The rudders may also be used to control depth.

Lasky et al. disclose (Abstract) a towed vehicle for positioning a towed device about a submarine, comprising: (a) a housing having a wing for providing lift when said housing is towed through water; (b) means coupled between said submarine and said housing for towing said housing; and (c) means coupled to said housing for varying the relative positions between the center of buoyancy and the center of gravity of said housing to dispose said wing in a given position. The Examiner cites Lasky et al. for disclosing a buoyancy element 62, and concludes it would have been obvious to modify Chiles et al. with the buoyancy element of Lasky et al. to afford better control of a deflector, and would have been predictable.

Ambs discloses (Abstract) a marine seismic system with a control system and at least one powered (manned or unmanned) tow vehicle with at least one seismic apparatus or system attached thereto, the at least one powered tow vehicle for selectively towing under its own power the at least one seismic apparatus or system. In one aspect such towing is done in controlled conjunction with movement of one or more host vessels. In another aspect such a marine seismic system includes at least one service boat for servicing the at least one powered tow vehicle. The Examiner cites Ambs for disclosing a streamer and lead-in, and concludes it would have been obvious to modify Chiles et al. with the streamer and lead-in of Ambs to afford better control of a deflector, and would have been predictable.

Vatne et al. disclose (see the Abstract and figures) a deflector (2) for installation in the tow-line (4, 5) between a towing vessel and a tow which is located in the water, e.g. a cable with seismic sources or a seismic source array, is suspended by a float (1) and has a fitting (9) therefrom having a tow-point (7) near the front part of the deflector connected to the tow-line (4), and an attachment point (8) to the rear of the deflector for further connection thereto of the rear part of the tow-line connected to the two. The Examiner cites Vatne et al. for disclosing a float, and concludes it would have been obvious to modify Chiles et al. with the float of Vatne et al. to afford better control of a deflector, and would have been predictable.

The Cited Art Distinguished

Chiles et al. lack disclosure or suggestion of “first and second actuators operated independently” to control angle of attack and tilt angle, as recited in presented application claims 1, 35 and 49, since in all embodiments disclosed in Chiles et al. depth and lateral movement are controlled by the same control features, i.e., they are not independently operated. There is no disclosure or suggestion of using the hitching device of the first embodiment of Chiles et al. to control angle of incidence at the same time but independently of the rudders of the second embodiment for controlling depth. Therefore, Applicants deem the rejection of claims 1-11, 13-18, 21, 25-31, 34-39, 49, 51, 54-55, and 58-68 and 70 as anticipated by Chiles et al. as untenable, and therefore traversed.

Lasky et al., Ambs, and Vatne et al. would not have helped the person or ordinary skill in the art to add known features to achieve predictable results to cure the deficiency of Chiles et al. pointed out above.

Regarding claims 12, 24 and 45 as rejected as being unpatentable over Chiles et al. in view of Lasky et al., the addition of a buoyancy element 62 of Lasky et al. to Chiles et al. still would not have erected a *prima facie* case of obviousness for any pending claim, as amended, as the recited feature “first and second actuators operated independently” to control angle of attack and tilt angle is still missing. As a *prima facie* case has not been made out, it is difficult to see how a conclusion of obviousness can be maintained for claims 12 and 24. The rejection of claim 45 is moot as that claim has been canceled.

Regarding claims 19 and 20 as rejected as being unpatentable over Chiles et al. in view of Ambs, the addition of streamer and lead-in cables of Ambs to Chiles et al. still would not have erected a *prima facie* case of obviousness for any pending claim, as amended, as the recited feature “first and second actuators operated independently” to control angle of attack and tilt angle is still missing. As a *prima facie* case has not been made out, it is difficult to see how a conclusion of obviousness can be maintained for claims 19 and 20.

Finally, regarding claims 22, 23, 32, 33, 47, 48 and 56 as rejected as being unpatentable over Chiles et al. in view of Vatne et al., the addition of a float of Vatne et al. to Chiles et al. still would not have erected a *prima facie* case of obviousness for any pending claim, as amended, as the recited feature “first and second actuators operated independently” to control angle of attack and tilt angle is still missing. As a *prima facie* case has not been made out, it is difficult to see how a conclusion of obviousness can be maintained for claims 22, 23, 32, 33, and 56. The rejections of claims 47 and 48 are moot as those claims have been canceled.

Even assuming a *prima facie* case of obviousness has been made out for any of the claims rejected as unpatentable in view of Chiles et al in combination with one of Lasky et al., Ambs, or Vatne et al., as detailed in the office action, it is submitted that the issue of the predictability of adding the various features of the secondary references misses the point in view of the currently amended claims. The feature of “first and second actuators operated independently” to control angle of attack and tilt angle would not have been predictable or obvious to the person of ordinary skill in the art, as independent control is generally considered more difficult, more costly, unstable, or some combination of these features.

Based on the above arguments, Applicants respectfully request allowance of the pending claims.

Respectfully submitted,

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